Development of an Efficient Technology for the Reduction of Kerch' Cast Iron

product with addition of lime. The experiments are described in detail and the following conclusions are made: to ensure favorable conditions of devanadization, the cast iron must not contain over 0.40% Si and not over 1.30% Mn. Low temperature air blowing-through ensures a complete vanadium oxidation reaction within 4 to 5 minutes. The process has to be carried out on a magnesite lining without addition of slag-forming elements into the converter. Chilling of the pool during the blowing-through process is performed by immersion of the water-cooled tuyeres into liquid metal, or by humid air blast. Vanadium slags with not over 15% silica content and a corresponding P_2O_5 content, equal to 12-18%, can be concentrated in order to obtain vanadium concentrates with a similar vanadium content as slags obtained by blowing-through of titanium-magnetite cast iron (according to experiments carried out by V.Ya. Shevtsova at the analytical laboratory of this Institute). The developed technological parameters of semi-product reduction ensure the production of low and medium carbon steel with not over 0.040% phosphorus and not over 0,004% nitrogen content. Owing to the use of semi-products with a high phosphorus content which are

SOV/180-59-2-6/34

AUTHORS: Makunin, M.S., Polyakov, A.Yu., and Samarin, A.M. (Moscow)

TITLE: Properties of Vanadium Obtained by Carbon-Thermic Reduction in a Vacuum (Svoystva vanadiya, poluchennogo metodom ugletermicheskogo vosstanovleniya v vakuume)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i Toplivo, 1959, Nr 2, pp 35-39 (USSR)

ABSTRACT: In previous communications (Refs 1,2) results of experiments on a process for producing malleable vanadium by reduction of V_2O_3 with carbon in a vacuum at a temperature below the metal melting point, are given. Further work showed that the reduction should be effected in several stages (the final one at 1680 to 1750 °C and 10^{-3} - 5 x 10^{-4} mm Hg) with intermediate crushing and rebriquetting. Table 1 shows the weight percentage of carbon and oxygen in the final product, the values being shown as functions of each other for various conditions in Fig 2. A better relation between carbon and oxygen was obtained with a high-capacity type BN-3 booster pump than with a type TsVL-100 diffusion pump. In experiments on the production of cast vanadium it was found that contamination with tungsten and nitrogen took

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Properties of Vanadium Obtained by Carbon-Thermic Reduction in a Vacuum

place when briquettes were arc melted in an argon atmosphere with tungsten electrodes. Consumable electrodes of briquetted vanadium made in a vacuum attachment on a type MTP-150 butt-welding machine, gave a purer product. A.I. Pugin participated in this part of the work. The electrodes were fused in an arc furnace with a 37-40 mm diameter water-cooled copper mould at 5 x 10^{-4} mm Hg. A typical cast and forged ingot contained 0.07, 0.016 and 0.038 % carbon, oxygen and nitrogen, respectively, the nitrogen content being almost the same as in the briquette used for the electrodes. As annealing (1100°C in vacuo) produces no structural changes the resultant decrease in hardness is attributed by the authors to the removal of internal stresses generated during the rapid cooling in the mould. The ingot was forged with a 75-kg hammer with re-heating to 800°C to a reduction of 68.5%. The heating of the ingot before and during forging was effected in air, but oxidation and nitrogen pick-up (leading to hardening) were confined to the surface layers

Card 2/3 (Fig 4 shows micro-hardness as a function of distance from

Properties of Vanadium Obtained by Carbon-Thermic Reduction in a Vacuum

surface). Mechanical tests were carried out on type KRD-3 tensile test-pieces made from the hot-forged bar. The results for the forged state and after annealing at 1000°C (Table 2) show high plasticity and adequate strength. Part of the material was cold rolled to a reduction of 87% without intermediate annealing: little work-hardening occurred (Fig 5 shows hardness as a function of relation deformation), and a 1.1 mm cold-rolled plate was rolled without intermediate annealing to 1.2 - 1.5 micron thick foil. Corrosion tests in boiling HCl (10 and 17%) and H_2SO_4 (10, 17 and 30%) solutions showed (Table 3) high resistance, greatly superior to that of titanium or type 1 Kh18N9T steel.

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There are 5 figures, 3 tables and 3 Soviet references.

SUBMITTED: October 8, 1958

POLYAKOV, A.Yu.; SAMARIN, A.M.; SYUY TSZEN-TSZI [Hsü TSeng-chi]

Investigating the activity of components of liquid binary alloys in the system iron - silicon. Izv. vys. ucheb. zav.; chern. met. no. 1:12-20 '61. (MIRA 14:2)

1. Institut metallurgii AN SSSR i Moskovskiy institut stali.
(Iron-silicon alloys) (Activity coefficients)

VOLKOV, S.Ye. (Moskva); LINCHEVSKIY, B.V. (Moskva); POLYAKOV, A.Yu. (Moskva); SAMARIN, A.M. (Moskva)

Using solid slag reagents for the desulfuration of metal in vacuum induction furnaces. Izv. AN SSSR. Met. i gor. delo no.4:47-51 Jl-Ag '64. (MIRA 17:9)

L 32912-65 EPA(s)-2/EWT(m)/EPF(n)-2/EWP(t)/EPR(bb)-2/EWP(b) Pad/Pt-10/Pu-4
IJP(c) JD/HW/HW/JG
ACCESSION NR: AP5001609 S/0279/64/000/006/0075/0080

AUTHOR: Hsu, Chia-lung; Kashin, V. I.; Polyakov, A. Yu.; Samarin, A. M.

TITLE: Investigation of the reducing capacity of carbon in liquid nickel

SOURCE: AN SSSR. Izvestiya. Metallurgiya i gornoye delo, no. 6, 1964, 75-80

TOPIC TAGS: liquid nickel, reduction, carbon, deoxidizing

ABSTRACT: The deoxidizing capacity of up to 0.17% carbon (added as Ni-C alloy containing 1-1.5% C) in electrolytic liquid nickel was investigated. Tests were run under a CO atmosphere; the metal was brought to temperature and held at 1525C for 1 hour. The temperature dependence of the equilibrium constant of the reaction describing the interaction between the C and O dissolved in the liquid nickel

$$[C]+[O]=CO_r,\ K=\frac{p_{CO}}{[\%C]f_C[\%O]f_O}$$

can be shown by the equation: $\lg K = 4060/T + 1.766$. In alloys containing up to 0.2% C, the equilibrium concentration of oxygen in liquid Ni-C-O alloys can be

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L 32912-65
ACCESSION NR: AP5001609

0

found by the relationship

$$\lg[\%O] = -\lg K - \lg[\%C] + 1.5[\%C]$$

With the given carbon content, the equilibrium concentration of residual oxygen was significantly lower in liquid nickel than in liquid iron, e.g., with 0.1% C and 1550 C the equilibrium concentration of O in liquid nickel and iron was 1.2 x 10^{-3} and 26 x 10^{-3} %, respectively. Orig. art. has: 38 equations, 4 figures and 1 table.

ASSOCIATION: None

SUBMITTED: 03May63 ENCL: 00 SUB CODE: GC

NR REF SOV: 007 OTHER: 000

Card 2/2

L 39470-65 EPA(s)-2/EWT(m)/EPF(n)-2/T/EWP(t)/EWP(b) Pt-10/Pu-4 IJP(c)
ACCESSION NR: AP4047868 JD/WW/JG S/0279/64/000/005/0003/0009

AUTHOR: Ikazin, V.Ye. (Moscow); Volkov, S.Ye. (Moscow); Polyakov, A. Yu. (Moscow); Samarin, A. M. (Moscow)

TITLE: High purity iron production in an induction vacuum furnace

SOURCE: AN SSSR. Izvestiya. Metallurgiya i gornoye delo, no. 5, 1964, 3-9

TOPIC TAGS: vacuum melting, fluorspar, lime, alumina, carbon concentration, gas pressure, slag, manganese, silicon, high purity iron, induction vacuum furnace, induction heating

ABSTRACT: A method of melting commercially pure iron was developed in a laboratory vacuum furnace with a 5 kg magnesite crucible. The slag forming mixture consisted of burned lime and fluorspar, however, a lime, fluorspar and alumina mixture was also tested. The best results were obtained with 90% CaO, 10% CaF_2 and 2 to 5 mm particles (see fig. 1). The optimal quantity for the slag forming mixture was 3% of the weight of the metal portion in the charge. Bottom charging is recommended. The process of desulfurization was found to be completed within 10 to 15 minutes after the melting of the metal occurs. The drastic decline in the carbon concentration during the coexistence of the liquid and the

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solid phase is followed by a gradual decrease in carbon. The amount of Si and Mn decreases from 0.10-0.25 to 0.03 to 0.07% while the metal is in the molten state. Slag does not cause the contamination of metal in the molten state. Slag does not cause the contamination of metal with slag particles and furnace pressures under 1 mm Hg prevent oxidation. Care must be taken to avoid a rise of the oxygen content above the 0.004 to 0.005% range. The nonmetallic inclusions were investigated by N. N. Smirnova under the supervision of Yu. T. Lukashevich-Duvanova, Doctor of technical sciences. Orig. art. has: 7 figures and 2 tables.

ASSOCIATION: None

SUBMITTED: 12Mar64 ENCL: 01 SUB CODE: MM

NR REF SOV: 005 OTHER: 002

BURTSEV, V.T. (Moskva); GIEBOVSKIY, V.G. (Moskva); POLYAKOV, A.Yu. (Moskva); SAMARIN, A.M. (Moskva)

Sulfur and oxygen distribution between iron and limestone-alumina slag during suspension smelting. Izv. AN SSSR. Met. no.6:24-27 N-D '65. (MIRA 19:1)

1. Submitted February 13, 1965.

L 23214-65 EWT(d)/EWT(m)/EWP(c)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(l)/EWA(h)/EPC(m)-6
ACC NR: AP6013575 IJP(c) JD SOURCE CODE: UR/0032/65/031/008/1020/1021

AUTHOR: Lomberg, B. S.; Vertman, A. A.; Yakobson, A. M.; Zheladnov, V. I.; Polyakov, A. Yu.

ORG: Institute of Metallurgy im. A. A. Baykov (Institut metallurgii)

TITLE: Unit for measuring the interphase metal-slag tension at high temperatures

SOURCE: Zavodskaya laboratoriya, v. 31, no. 8, 1965, 1020-1021

TOPIC TAGS: furnace, slag, thermocouple, vacuum seal, x ray application, molten metal, corundum, magnesite

ABSTRACT: This device is a resistance furnace with a two-filament heater. A crucible is placed in the isothermal zone of the heater on a magnesite support. The melting point is measured with a platinum-platinum-rhodium thermocouple set on the bottom of the crucible. A device mounted on the top cover permits adding of slag during the experiment. Sealing of the assembly is done with vacuum seals. Viewing windows are covered with 0.1-0.2 mm thick aluminum foil. Construction of the unit permits its operation in either a vacuum or in a neutral gas atmosphere. Experiments were conducted on corundum and magnesite crucibles, 35 mm in diameter. A substrate cut from a cylindrical crucible of smaller diameter made of the same material is placed on the bottom of the crucible. Diameter of the metal drop on this substrate is 18-20 mm. To obtain an upper edge of the

UDC: 620.1.052

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L 23214-66

ACC NR: AP6013575

substrate border in the form of a true sphere, it is polished with convex and concave spheres. This provided for symmetry of the liquid metal drop. X-rays were taken with an RUP-1 x-ray device.

Because of the protective shields and the intensive water cooling of the furnace housing it is possible to place the film at a minimum distance from the object. The film is placed in an aluminum cassette protected from scattering radiation by lead plates, 2 mm thick. Distance from the center of the drop to the film is 10 cm and 110 cm to the focal point of the tube. A clear image of the metal drop in the slag is obtained when the voltage on the tube is 180 kilovolts, current force-15 milliamps, and at an exposure time of 40-60 seconds. The interphase stress is calculated according to the dimensions of the drops found. The interphase tension of certain nickel-base alloys with slags was determined. The unit can be recommended for measuring the interphase tension between metals and slags of different compositions. Orig. art. has: 2 figures and 1 table. [JPRS]

SUB CODE: 13 / SUBM DATE: none / ORIG REF: 001

Card 2/2 MLS

L 36118-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD/GD
ACC NR: AT6016940 (N) SOURCE CODE: UR/0000/65/000/000/0087/0096

AUTHORS: Filipp, G. I., Burtsev, V. T.; Polyakov, A. Yu.; Samarin, A. M. 57

ORG: None B+1

TITLE: Degassing of iron carbide melts in vacuum

SOURCE: AN SSSR. Institut metallurgii. Protsessy vosstanovleniya i plavleniya zheleza (Processes of reduction and melting of iron). Moscow, Izd-vo Nauka, 1965, 87-96

TOPIC TAGS: Vacuum degassing, iron base alloy, gas kinetics, carbide /MKh-13-02 mass spectrophotometer, 10

ABSTRACT: Quantity and composition of gases evolved during evacuation of iron carbide melts and subsequent deoxidation with silicon, manganese, and aluminum have been investigated. The amount of the evolved gases was determined at constant pressure by means of a rheometer, and the gaseous samples were analyzed on a mass spectrophotometer MKh-13-02. The diagrams of the experimental set-up and vacuum induction furnace are shown, and the composition of the metal, specific gas evolution, and composition of the extracted gas are tabulated.

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L 36113-66
ACC NR: AT6016940

Specific gas evolution from iron carbide as function of the carbon content and method of reduction are illustrated in Fig. 1. The kinetics of the removal of various gases under various conditions is also illustrated. Specific gas evolution from Fe-C-O melt at 1873K and 0.01--0.2 mm

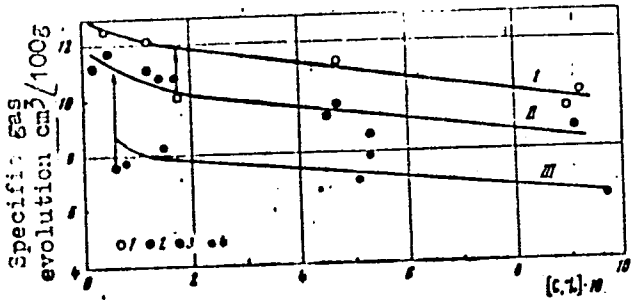

Fig. 1. Specific gas evolution of iron carbide melt at 1873C and 0.01—0.02mm, as function of carbon content and reduction: 1- no reduction; 2 - reduction with 0.4% Mn; 3 - reduction with 0.4% Mn + 0.2% Si; 4 - reduction with 0.4% Mn + 0.2% Si + 0.1% Al; (Time of gas sampling: I - at melting; II - in 5 min; III - in 10 min after melting.)

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L 36118-66
ACC NR: AT6016940

changes in the interval of C content 0.005--1.0% from 9.70 to 12.51 cm ^{3}/100g, decreasing proportionally with an increased C content. Specific gas evolution of such melts deoxidized by Si, Mn, or Al is decreased 1.5 times. The rate of degassing of the metal melted in crucibles is 1.5 to 2 times higher than when it is melted in a suspension. Orig. art. has: 6 figures and 2 tables.

SUB CODE: 20/ SUBM DATE: 27 Sep 65/ ORIG REF: 008/ OTH REF: 002

3/3 egh

LOMBERG, B.S.; VERTMAN, A.A.; YAKOBSON, A.M.; ZHELADNOV, V.I.; POLYAKOV, A.Yu.

Apparatus for measuring the metal-slag interphase tension at high temperatures. Zav. lab. 31 no.8:1020-1021 '65. (MIRA 18:9)

1. Institut metallurgii imeni Baykova.

SYUY 'ISZYA-LUN [Hsu Chia-lung] (Moskva); KASHIN, V.I. (Moskva); POLYAKOV, A.Yu. (Moskva); SAMARIN, A.M. (Moskva)

Study of the reducing properties of carbon in liquid nickel. Izv. AN 'SSSR. Met. i gor. delo no.6:75-80 N-D '64. (MIRA 18:3)

L 65050-65 EPA(s)-2/EWT(m)/EPF(c)/EPF(n)-2/EWP(t)/EWP(z)/EWP(b) IJP(c)
MJW/JD/WW/HW/JG
ACCESSION NR: AP5021495 UR/0370/65/000/004/0037/0045
669.046.542

39

AUTHOR: Stomakhin, A. Ya. (Moscow); Bayer, P. (Moscow); Polyakov, A. Yu. (Moscow)

B

TITLE: Solubility of nitrogen in molten nickel and in alloys of nickel with chromium, molybdenum and tungsten

SOURCE: AN SSSR. Izvestiya. Metally, no. 4, 1965, 37-45

TOPIC TAGS: nitrogen, nickel, molten metal, nickel base alloy, chromium containing alloy, molybdenum containing alloy, tungsten containing alloy, solubility

ABSTRACT: The low solubility of nitrogen in molten nickel has caused discrepancies in the experimental data for this solubility in the literature. Since nitrogen is always present in metals and alloys, and data on the solubility and activity of nitrogen are important for elimination of nitrogen from a melt (or in some cases for saturating a melt with nitrogen), the authors studied the solubility of nitrogen both in molten nickel and in binary nickel-based alloys containing additions of technically important elements. The experimental setup is described in detail. N-0 nickel of 99.987% purity was used in the experiments. Provisions were made to keep experimental errors to a minimum. The results are tabulated and graphed. The

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L 65050-65

ACCESSION NR: AP5021495

process for dissolution of nitrogen in nickel is given by the equation

$$\tfrac{1}{2}N_{2(gas)} = [N];\ K = \frac{f_N[\%N]}{p_{N_2}^{1/2}}$$

where [%] is the concentration of nitrogen in the metal which is the equilibrium concentration at a given temperature with partial pressure of nitrogen in the gaseous phase p_{N_2}; f_N is the activity factor which takes account of deviations of solutions of nitrogen in liquid metal from Henry's law. Mathematical analysis of the results of this study gives the following equation for the equilibrium constant of this reaction as a function of temperature:

$$\lg K = \lg[\%N] = -\frac{3010}{T} - 0.973$$

$$\Delta F^\circ = 69\,000 + 18.6T,\ \text{joules/g·at}$$
$$(\Delta F^\circ = 16\,500 + 4.45T,\ \text{cal/g·at}$$

It was found that chromium, molybdenum and tungsten reduce the activity factor of nitrogen in nickel (see fig. 1 of the Enclosure). This is apparently due to the

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ACCESSION NR: AP5021495

fact that these elements have more affinity for nitrogen than for nickel. The parameters of interaction for these elements are

$$e_N^{Cr} = -0.11,\ e_N^{Mo} = -0.04,\ e_N^{W} = -0.026.$$

Orig. art. has: 6 figures, 4 tables, 5 formulas.

ASSOCIATION: none

SUBMITTED: 10Dec64 ENCL: 01 SUB CODE: MM, GC

NO REF SOV: 001 OTHER: 008

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L 65050-6

ACCESSION NR: AP5021495

ENCLOSURE: 01

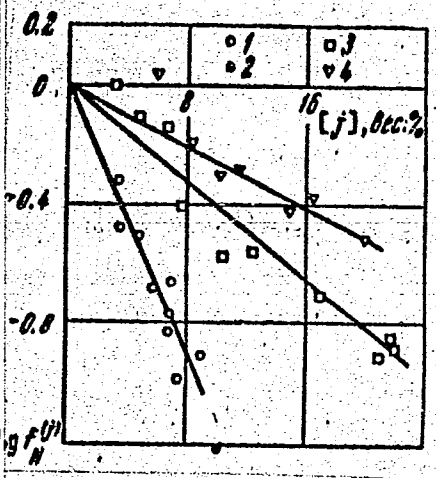

Fig. 1. Effect of chromium, molybdenum and tungsten on the activity factor of nitrogen in molten nickel at 1550°C and p_{N_2} = 760 mm Hg: 1--Ni-Cr alloys; 2--the same from data of Humbert and Elliott (Humbert, J. C., Elliott, J. F., "Solubility of Nitrogen in Liquid Fe-Cr-Ni Alloys," *Trans. Met. Soc. AIME*, 1960, 218, N 6, 1076-1088); 3--Ni-Mo alloys; 4--Ni-W alloys.

Card 4/4

VOLKOV, S.Ye.; LINCHEVSKIY, B.V.; POLYAKOV, A.Yu.; SAMARIN, A.M.

Desulfuration of steel in vacuum induction furnaces. Stal'
25 no.2:129-132 F '65. (MIRA 18:3)

[illegible], V.[illegible]; [illegible], G.I.; [illegible], A.Ye.; SAMARIN, A.M.

Studying the kinetics of gas liberation in the vacuum treatment of liquid iron. Zav. lab. 31 no.1:80-83 '65.

(MIRA 18:3)

1. Institut metallurgii imeni Baykova.

BURTSEV, V.T. (Moskva); KARASEV, R.A. (Moskva ; POLYAKOV, A.Yu. (Moskva); SAMARIN, A.M. (Moskva)

Investigatin, with the help of a mass-spectrometer, the products of the decarburization reaction during the smelting of iron in vacuum. Izv. AN SSSR. Met. no.1:55-58 Ja-F '65. (MIRA 18:5)

SKAZIN, V.Ye. (Moskva); VOLKOV, S.Ye. (Moskva); POLYAKOV, A.Yu. (Moskva); SAMARIN, A.M. (Moskva)

Preparing high-purity iron in induction vacuum furnaces. Izv. AN SSSR. Met. i gor. delo no.5:3-9 S-O '64. (MIRA 18:1)

L 11335-65 EPA(s)-2/EWT(m)/EPF(n)-2/EWA(d)/EWP(t)/EWP(b) Pt-10/Pu-4 MJW/
JD/WW/JG
ACCESSION NR: AP4043916 S/0279/64/000/004/0047/0051

AUTHOR: Volkov, S. Ye. (Moscow); Linchevskiy, B. V. (Moscow); Polyakov, A. Yu. (Moscow); Samarin, A. M. (Moscow) B

TITLE: Use of solid slag reagents for desulfurizing metal in vacuum induction furnaces

SOURCE: AN SSSR. Izv. Metallurgiya i gornoye delo, no. 4, 1964, 47-51

TOPIC TAGS: 1Kh18N9, stainless steel, ShKh15 ball bearing steel, steel vacuum induction melting, metal desulfurization, steel desulfurization, stainless steel desulfurization, ball bearing steel desulfurization

ABSTRACT: Experiments have been conducted to determine the effectiveness of solid slag-forming desulfurizers, such as lime, a mixture of fluorspar and alumina, lime with fluorspar, or lime with fluorspar and quartz sand, in vacuum induction melting of 1Kh18N9 stainless steel and ShKh15 ball-bearing steel. Best results were obtained with a lime + 10% fluorspar mixture, which had a grain size of 2--5 mm and

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ACCESSION NR: AP4043916

was used in an amount of 3% of the charge weight and placed on the bottom of the furnace crucible. The sulfur content of the stainless steel dropped from 0.0055--0.030% to 0.002--0.003%. The desulfurization occurs in the first 8--10 min; longer holding causes no additional drop. A fresh mixture must be used for each heat. In the case of ball-bearing steel, prolonged holding of liquid metal in contact with a slag mixture had a beneficial effect. With holding for 35 min the sulfur content was reduced from an original 0.01% to 0.0015--0.0035%. The use of solid desulfurizers had no adverse effect on the melting process nor on the economic indices of the process. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 21Nov63 ATD PRESS: 3100 ENCL: 00

SUB CODE: MM NO REF SOV: 003 OTHER: 000

Card 2/2

SYUY TSZYA-LUN [Hsü Chia-lung] (Moskva); [illegible], A. Yu. (Moskva); SAMARIN, A.M. (Moskva)

Effect of vacuum on an increase in the deoxidizing properties of carbon in iron-carbon melts. Izv. AN SSSR Met. i gor. delo no.2: 17-25 Mr-Ap'64 (MIRA 17:8)

POLYAKOV, A. Yu. (Moskva); [illegible] (Moskva); [illegible] (Moskva)
MOLDAVSKIY, O.I. (Moskva)

Studying the conditions of liquid steel desulfurization with the help of CaF_2-base slags. Izv. AN SSSR Met. i gor. delo no.[illegible] (MIRA 17:1) 52-57 My-Je '64.

SYUY TSZYA-LUN [Hsü Chia-lung] (Moskva); KASHIN, V.I. (Moskva); POLYAKOV, A.Yu. (Moskva); SAMARIN, A.M. (Moskva)

Thermodynamic properties of oxygen solutions in Ni-Cr and Ni-Cr-C melts. Izv. AN SSSR. Met. i gor. delo no.5:58-63 S-O '63. (MIRA 16:11)

STOMAKHIN, A.Ya.; POLYAKOV, A.Yu.

Unit for determining the solubility of nitrogen in liquid alloys. Biul.tekh.-ekon.inform.Gos.nauch.-issl.inst.nauch. i tekh.inform. 16 no.11:10-11 '63. (MIRA 16:11)

AFANAS'YEV, Yu.M. (Moskva); LINCHEVSKIY, B.V. (Moskva); POLYAKOV, A.Yu. (Moskva); SAMARIN, A.M. (Moskva)

Using slag for the desulfuration of steel in vacuum induction furnaces. Izv. AN SSSR. Otd. tekh. nauk. Met. i gor. delo no.3:76-82 My-Je '63. (MIRA 16:7*

(Steel--Electrometallurgy) (Desulfuration) (Slag)

L 13597-63 EWP(q)/EWT(m)/BDS AFFTC/ASD JD
ACCESSION NR: AP3002387 S/0279/63/000/003/0076/0082 56

AUTHOR: Afanas'yev, Yu. M. (Moscow); Linchevskiy, B. V. (Moscow); Polyakov, A. Yu. (Moscow); Samarin, A. M. (Moscow)

TITLE: Use of slag for steel desulfurization in vacuum induction furnaces

SOURCE: AN SSSR. Izv. Otd. tekhnicheskikh nauk. Metallurgiya i gornoye delo, no. 3, 1963, 76-82

TOPIC TAGS: induction melting, vacuum, nitrogen atmosphere, high-carbon steel, medium-carbon steel, low-carbon steel, desulfurization, synthetic slag, ferrous oxide content, optimum holding time

ABSTRACT: In order to determine the feasibility of deep desulfurization of steel in a vacuum induction furnace with highly desulfurizing synthetic slag, several steels containing 0.035, 0.41, and 1.19% C and from 0.09 to 0.128% S were treated with two synthetic slags. One slag contained 53.8% CaO, 6.6% SiO_2, 40.3% Al_2O_3, and 0.32% FeO; the other slag, 60.4% CaO, 28.8% SiO_2, 10.9% Al_2O_3, and 0.06% FeO. Three variants of treatment were tested: without synthetic slag, vacuum with synthetic slag, and nitrogen atmosphere at 1.1 atm with synthetic

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ACCESSION NR: AP3002387

slag. The slag (6—10 wt% of the metal charge) was put on the crucible bottom under the metal charge; the molten metal was held under liquid slag for 30—50 min at 1500—1700C in a vacuum of 0.05—1.0 mm Hg. Test results showed that regardless of the carbon content, the desulfurizing effect of vacuum alone is very low. Treatment with synthetic slag in combination with nitrogen atmosphere or vacuum reduced the sulfur content in the high-carbon (1.19% C) steel from about 0.2 to 0.02% within the first 15—20 min of the holding time, with practically no change after longer holding. In medium-carbon (0.41% C) or low-carbon (0.035% C) steel, a sharp drop in the sulfur content from 0.12 to 0.01% or even less occurred in the first 10 min, followed by a slight reverse influx of sulfur into the metal during prolonged holding. The different effect of the furnace pressure on desulfurization of low-, medium-, and high-carbon steels is associated with the effects of the FeO content in the slag. The lower the FeO content, the lower the sulfur content in the metal bath. However, in melting steels with a carbon content over 1% the FeO content of the slag does not depend much on the furnace pressure; while in melting low-carbon steels deeper vacuum results in a lower FeO content. The desulfurizing effect of other slag components is much weaker that that of FeO. The highest desulfurization (77% for low-carbon and

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L 13597-63
ACCESSION NR: AP3002387

95% for high-carbon steel) was achieved by vacuum melting under a synthetic slag. Melting under a synthetic slag in nitrogen resulted in a desulfurization of 13% for low-carbon and 84% for high-carbon steel, while vacuum melting without a slag reduced the sulfur content by 11 and 23% for the low- and high-carbon steels, respectively. The optimum holding time should not exceed 15—25 min. Orig. art. has: 6 figures, 4 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 13Sep62 DATE ACQ: 12Jul63 ENCL: 00

SUB CODE: ML NO REF SOV: 000 OTHER: 000

Card 3/3

POLYAKOV, A. 44.

PHASE I BOOK EXPLOITATION SOV/6270

Samarin, A. M., ed., Corresponding Member, Academy of Sciences USSR.

Vakuumnaya metallurgiya (Vacuum Metallurgy). Moscow, Metallurgizdat, 1962. 515 p. Errata slip inserted. 3200 copies printed.

Ed. of Publishing House: V. I. Ptitsyna; Tech. Ed.: L. V. Dobuzhinskaya.

PURPOSE: This book is intended for engineering personnel of metallurgical and machine-building plants, scientific research workers and teachers, and aspirants and students at schools of higher technical education.

COVERAGE: Thermoydnamic fundamentals of vacuum application in various metallurgical processes and problems of melting in vacuum induction and arc furnaces are discussed. Procedures of casting large ingots and vacuum degassing of steel in ladles are described, along with designs of metallurgical vacuum equipment. Problems connected with the use of mechanical and steam-ejector vacuum pumps, and with the

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designing, calculation, and operation of vacuum systems, are reviewed in detail, along with vacuum-measuring techniques. No personalities are mentioned. Each article is accompanied by references, mostly Soviet.

TABLE OF CONTENTS:

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PUPYNIN, V.P.; SYUY TSZEN-TSZI [Hsü Tsêng-chi]; POLYAKOV, A.Yu.; SAMARIN, A.M.

Investigating the activity of components in liquid binary systems nickel - carbon. Trudy Inst.met. no.10:155-161 '62. (MIRA 15:8)

(Nickel alloys—Thermal properties) (Activity coefficients)

YAN NEN'-TSZU [Yang Nên-tsu]; MAKUNIN, M.S.; POLYAKOV, A.Yu.; SAMARIN, A.M.

Investigating the process of obtaining ferrovanadium and ferrotungsten in vacuum. Trudy Inst.met. no.10:246-251 '62. (MIRA 15:8)

(Iron alloys) (Vacuum metallurgy)

S/509/62/000/010/001/005
I003/I242

AUTHORS: Pupynin, V.P., Hsü Tseng-chi, Polyakov, A. Yu, and Samarin, A.M.

TITLE: Investigation of the activity of the components in molten binary alloys of the nickel-carbon system

SOURCE: Akademiya nauk SSSR. Institut Metallurgii. Trudy, no. 10. Moscow, 1962, 155-161. Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya

TEXT: The investigation of the thermodynamic properties of molten nickel alloys is not only of theoretical interest: it serves to determine the optimum composition and the best process for the

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S/509/62/000/010/005/005
I003/I203

AUTHORS: Yang Nan-tsu, Makunin, M.S., Polyakov, A.Yu., and Samarin, A.M.

TITLE: Investigation of the vacuum preparation of ferrovanadium and ferrotungsten

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Trudy, no. 10. Moscow, 1962, 246-251. Metallurgiya, metallovedeniye, fiziko-khimicheskiye metody issledovaniya

TEXT: The reduction of vanadium pentoxide in vacuum is less expensive than the present USSR process of reduction by ferrosilicon and aluminum in an electric furnace. The kinetics

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S/137/62/000/003/046/191
A006/A101

AUTHORS: Gitgarts, D. A., Polyakov, A. Yu., Rudneva, A. V.

TITLE: Concentration of vanadium slags with high phosphorus content

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 3, 1962, 22, abstract 3G144 (V sb. "Fiz.-khim. osnovy proiz-va stali", Moscow, AN SSSR, 1961, 271 - 276)

TEXT: The process of concentrating poor V-slags was studied in a laboratory. For this purpose a fine-crushed slag specimen was processed in a water bath for one hour with a HCl solution at 70 - 75°C, by stirring periodically. An amount of 5 - 10 ml gelatin was added to the solution, 5 - 10 minutes before removing it from the bath, to bring about coagulation of silica. The non-dissolved precipitate was then filtered off and boiled for 1 hour in a 10% soda solution, in order to bring SiO_2 into a soluble state. At silica contents exceeding 20%, the concentrates may contain $\leq$ 10 - 12% V_2O_3. Slags containing 14 - 18% SiO_2, make it possible to obtain concentrates with 10 - 15% V_2O_3 at a consumption of 2.5 - 3.0 g HCl per 1 ton of slag. Extraction of V is then 80 -85%. In such a manner, the chemical concentration method makes it possible to obtain V concentrates whose V content is prac-

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OKOHOKOV, G.N. (Moskva); POLYAKOV, A.Yu. (Moskva); SAMARIN, A.M. (Moskva)

Oxygen removal in the process of vacuum remelting of special steels in electric arc furnaces. Izv. AN. SSSR. Otd. tekh. nauk. Met. i topl. no.3:3-9 My-Je '61. (MIRA 14:7)
(Steel--Electrometallurgy)

SYUY TSZEN-TSZI [Hsü Tsêng-chi] (Moskva); POLYAKOV, A. Yu. (Moskva); SAMARIN, A.M. (Moskva)

Oxygen solubility in liquid iron-silicon alloys at atmospheric pressure and in vacuum. Izv. AN. SSSR. Otd. tekh. nauk. Met. i topl. no.2:115-118 Mr-Ap '61. (MIRA 14:4)
(Iron-silicon alloys—Oxgen content)

22973

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S/180/61/000/003/001/012
E111/E135

AUTHORS: Okorokov, G.N., Polyakov, A.Yu., and Samarin, A.M. (Moscow)

TITLE: Removal of oxygen in arc vacuum remelting of special steels

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1961, No.3, pp. 3-9

TEXT: Vacuum arc remelting is now widely used for special steels and its efficacy has been established by the present authors (Ref.3: Izv. AN SSSR, OTN, 1958, No.5) and W.W. Dyrkacz (Ref.1: Iron Age, 1955, v. 176, No.7, and Ref.2: J. Metals, 1957, v. 9, December). The authors (Ref.8: Filial VINITI AN SSSR, Peredovoy proizvodstvennyy i nauchno-tekhnicheskiy opyt, 1959, No. M-59-270/6) and others have studied technological and theoretical aspects of the process, but sufficient attention has not been given to the way in which it eliminates oxygen and oxide non-metallic inclusions. Indications (Ref.8) are that the more favourable vacuum conditions for reaction of metallic oxides are not due to the carbon. On the basis of results of vacuum arc

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Removal of oxygen in arc vacuum remelting of special steels

remelting of low-carbon iron initially deoxidized with various deoxidizers or initially not deoxidized, it was proposed that oxygen in the form of stable non-metallic inclusion could be removed without participation of the carbon (Ref.8). To check these results the experiments have been repeated. Ingots from a 12-kg open induction furnace were forged to 40-45 mm diameter rods and two electrodes from each ingot were prepared. These were remelted in an arc vacuum furnace with a 75-mm diameter mould, one of each pair in vacuum (10^{-2} to 10^{-3} mm Hg) and the others in still argon at 760 mm Hg; silicon, manganese and aluminium were used for deoxidation. Both procedures were effective in removing oxygen, vacuum giving the better results (up to 89% removal). The amount removed was always greatly in excess of the decrease in carbon. To study the relation between the amount of CO evolved and the change in carbon and oxygen content through vacuum arc remelting, the composition and quantity of gas evolved in the remelting of deoxidized (silicon, aluminium, manganese) and not deoxidized low-carbon iron was investigated. Pressure change (in the range

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Removal of oxygen in arc vacuum remelting of special steels

10^{-3} to 5 x 10^{-2} mm Hg) in a constant volume was used to measure the quantity of gas evolved in one minute (assumed independent of pressure). The melting current was 1200 amp, the voltage 21-23 V. The rate of melting of deoxidized iron was 450-400 and of undeoxidized 400-315 g/min. At low gas evolutions all the gas was assumed to be CO. The results are shown in Table 2. In the deoxidized metal the product of dissolved oxygen and carbon changes little on vacuum remelting and remains well above even the atmospheric-pressure equilibrium value. From the melting conditions it appears that flotation (i.e. effects leading to the concentrations of inclusions at or near the surface) must be an important factor. In manganese-deoxidized metal, where the carbon reaction is favoured by inclusions of x FeO. y MnO or MnO on which CO bubbles can nucleate, both factors are important; in undeoxidized metal the carbon reaction is decisive. With undeoxidized metal the boil produced by vacuum remelting makes this more effective than argon remelting. The arrival of metal at the bath in the form of fine droplets and vertical movement of the

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crystallization front also contribute to mechanical removal of inclusions. It has been shown that repeated arc remelting of ШХ -15 (ShKh-15) steel (0.0045% O, 0.018 S, 0.38 Mn) reduces the inclusions greatly and that the effect is not due to increased time in the molten state (variations represented by different ingot weights) but by the remelting process itself. The demonstrated decisive role of mechanical factors as distinct from the carbon reaction in vacuum arc remelting of special steels provides a theoretical justification for applying the method irrespective of carbon content. There are 2 figures, 3 tables and 8 references: 3 Soviet and 5 English. The four most recent English language references read as follows:

Ref.2: W.W. Dyrkacz, J. Metals, 1957, v. 9, December.
Ref.4: E.W. Johnson, J.T. Hahm, B. Itoh. Arcs in inert atmospheres and vacuum, 1956.
Ref.5: H. Gruber. Arcs in inert atmospheres and vacuum, 1956.
Ref.6: H. Gruber. J. Metals, 1958, v. 10, No.3.

SUBMITTED: May 30, 1960

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POLYAKOV, B.

Agriculture

Decline in agriculture of capitalist countries during the postwar years, Vest. stat., No. 1, 1952.

Monthly List of Russian Accessions, Library of Congress, July 1952. Unclassified.

POLYAKOV, Boris

Awakened wasteland. IUn. nat. no.8:6-7 Ag '62. (MIRA 15:9)
(Golodnaya Steppe--Irrigation)

POLYAKOV, B. A.

Capacitors for Increasing the Power Factor (Kondensatornyye ustanovki dlya povysheniya koeffitsienta moshchnosti), Moscow-Leningrad, Gosenergoizdat, 1950, 176 pp. with sketches.

USSR/Electricity - Conferences Jan 52
Capacitors

"Conference of Rostov Oblast Power Engineers on Problems of Operation and Repair of Capacitors to Raise the Power Factor"

"Prom Energet" No 1, p 29

Conference, held jointly by Energosbyt of Rostovenergo and Rostov Branch of VNITOE, heard papers (primarily on capacitor repair methods at enterprises) by B. A. Polyakov, Sr Engr of Production Eng Div, "Kavelektromontazh" Trust. Grol' of

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"Nesvetayantratsit" Trust of Rostovugol' Combine Lapin of "Kalorifer" Plant, and Sotnikov of "Rostsel'mash" Plant.

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FOLYAKOV, B. A.

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USSR/Electricity - Capacitors Jul 52
Power Factor

"Letter to the Editors," B. A. Polyakov, "Kavelektromontazh" Trust

Prom Energet, No 7, p 28

Author replies to letter (Ibid, No 3, 1952) by D. S. Chernichkin, Dep Min of Elec Industry. Latter quoted article by author (Ibid, No 6, 1951) as favoring giving responsibility for capacitor repair to power-supplying organizations (establishments of Min Elec Power Stas). Author refutes Chernichkin's assertions, claims enterprises of Min Elec Industry are better equipped for capacitor repair, should handle it.

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POLYAKOV, B.A., inzhener.

Selecting condensers for increasing the capacity coefficient. Energetik 1 no.1:34-37 Je '53. (MLRA 6:8)

(Condensers (Steam))

POLYAKOV, B.A., inzhener.

Commutation schemes of condenser installations for increasing the capacity. (MLRA 6:8)
Energetik 1 no.2:25-29 Jl '53. (Condensers (Electricity))

POLYAKOV, B.A.

POLYAKOV, B.A., inzhener; ABRAMOVICH, G.P., inzhener; KAYALOV, G.M., dotsent, kandidat tekhnicheskikh nauk.

Remarks on B.A.Teleshev's article "Necessity of rendering the terminology in problems of reactive capacity measurements more precise." Elektrichestvo no.1:79-81 Ja '54. (MLRA 7:2)

1. Kavelektromontazh (for Polyakov). 2. Khar'kovskiy institut inzhenerov zheleznodorozhnogo transporta (for Abramovich). 3. Novocherkasskiy politekhnicheskiy institut (for Kayalov). (Teleshev, V.A.) (Electric engineering--Terminology)

POLYAKOV, B. A.

AID P - 685

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 20/24

Author : Polyakov, B. A.

Title : Some questions on the performance of capacitors

Periodical : Energetik, 7, 36, Jl 1954

Abstract : The author gives short answers to three questions concerning the performance and operation of capacitors of the KM-O, 42-6-3 type.

Institution : None

Submitted : No date

POLYAKOV, B.A.

AID P - 1948

Subject : USSR/Electricity

Card 1/1 Pub.29 - 28/31

Author : Polyakov, B. A.

Title : Connecting capacitor batteries in parallel operation

Periodical : Energetik, 3, 38-39, Mr 1955

Abstract : In reply to a question from a reader, the author gives a detailed answer based on the Rules for the operation of electrical equipment in industrial enterprises.

Institution: None

Submitted : No date

Polyakov, B.A.

AID P - 1950

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 30/31

Author : Polyakov, B. A.

Title : Installation of 400-v static capacitors of the KBG-MN type

Periodical : Energetik, 3, 40, Mr 1955

Abstract : In reply to a question from a reader, the author explains that this type of capacitor is intended to work in d-c and in pulsating networks. Because of the shortage of power capacitors of the KM type, the KBG-MN type capacitors have been temporarily admitted for use for power-factor improvement. He gives details of installation.

Institution: None

Submitted : No date

POLYAKOV, B. A

AID P - 3011

Subject : USSR/Electricity

Card 1/1 Pub. 29 - 26/28

Author : Polyakov, B. A.

Title : Testing power capacitors with increased a-c voltage

Periodical : Energetik, 6, 39, Je 1955

Abstract : In reply to a question by a reader, the author explains that the oil-testing apparatus of the AMI-60 type mentioned by the reader cannot be used to test power capacitors of the KM type. Chapter 569 of the "Rules for the Technical Operation of Electric Installations in Industrial Establishments" in the newest, revised version (1953) gives details concerning testing of capacitors.

Institution : None

Submitted : No date

KASHIRIN, G.P.; BORISOV, N.S.; POLYAKOV, B.A.

Using motor cranes in stretching reinforcing wire. Suggested by G.P. Kashirin, N.S. Borisov, B.A. Poliakov. Rats. predl. no. 41:6 '59. (MIRA 14:1)

(Reinforced concrete)

POLYAKOV, B.A.

Increasing the power factor by discharging capacitor batteries. (MIRA 12:1)
Energetik 7 no.1:34 Ja '59.
(Electric capacitors)

POLYAKOV, B.A.

Increase of power coefficients with the aid of static condensers. (MIRA 14:1)
Energetik 8 no. 10:37 O '60.
(Condensers (Electricity))

L 23216-66 EWT(d)/EWP(k)/EWP(1)

ACC NR: AP6013582 SOURCE CODE: UR/0144/65/000/010/1181/1182

AUTHOR: Avilov-Karnaukhov, B. N.; Bogush, A. G.; Gikis, A. F.; Drozdov, A. D.; Malov, D. I.; Sinel'nikov, Ye. M.; Brusentsov, L. V.; Denisov, A. A.; Pal'shau, M. V.; Polyakov, B. A.; Chernyavskiy, F. I.; Burok, V. S.; Gordeyev, V. I.; Kazhdan, A. E.; Kovalev, V. Ye.; Kurennyy, E. G.; Potapenko, V. Ya.

ORG: none

TITLE: Professor G. M. Kayalov on the occasion of his 60th birthday and 37 years of pedagogical activities

SOURCE: Izvestiya vysshikh uchebnykh zavedeniy. Elektromekhanika, no. 10, 1965, 1181-1182

TOPIC TAGS: electric engineering personnel, academic personnel

ABSTRACT: Doctor of Engineering Sciences, Professor of RIIZhT /Rostovskiy institut inzhenerov zheleznodorozhnogo transporta: Rostov Institute of Railroad Engineers/, Georgiy Mikhaylovich KAYALOV was born on 26 September 60 years ago. He began his working career as a standby electrical construction worker at the Novorossiysk cement factory. In 1925 he graduated from the Novocherkassk Polytechnical Institute, and between 1928 and 1947 worked in the designing section of the "Elektroprom" trust. Sub-

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ACC NR: AP6013582

sequently, he joined the Rostov department of the GPI /Gosudarstvennyy proyektnyy institut; State Designing Institute/ "Tyazhpromelektroproyekt" where he advanced from a technician of the designing department to its chief engineer. From 1933 to 1962 he was docent of the department of electrification of industrial enterprises of the NPI /Novocherkasskiy politekhnicheskiy institut imeni Sergo Ordzhonikidze; Novocherkassk Politechnic Institute im. Sergo Ordzhonikidze/; he taught as professor until 1965 and presently is a professor of the RIIZhT. He published more than 70 scientific works, including studies of flywheel-containing electric motors, investigations of electrical loads of industrial enterprises, analyses of basic features of real load graphs, (including their probabilistic modeling), proposals for peak load calculation methods (based on the theory of mass servicing) and developments of methods for the calculation of extremal loads of heavy consumers, for the study of random graphs of reactive loads, for the evaluation of electric load fluctuations, and the like. G. M. KAYALOV was also active in the Party, professional, and scientific organizations. He is a holder of the "For Outstanding Work During the Great Patriotic War of 1941-1945 gg." medal and the "Badge of Honor" decoration. Orig. art. has: 1 figure. [JPRS]

SUB CODE: 09, 05 / SUBM DATE: none

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POLYAKOV, B.A.

Overhauling of KM-type condensers. Prom. energ. 18 no.8:61 Ag '63.
(MIRA 16:9)

(Condensers (Electricity))

BOLYAKOV, B.A.

Concerning the protection of static condenser batteries and their installation in rooms. Energetik 10 no.12:27-28 D '62. (MIRA 16:1)

(Electric power distribution) (Condensers (Electricity))

AUTHOR: Polyakov, B.A. SOV/91-59-1-19/26

TITLE: On the Discharge of Condenser Installations to Raise the Power Factor (Razryad kondensatornykh ustanovok dlya povysheniya koeffitsiyenta moshchnosti)

PERIODICAL: Energetik, 1959, Nr 1, p 34 (USSR)

ABSTRACT: The question asked by F.F. Geyne from the village of Alga, Kazakhskaya SSR, reads: Paragraph 600 of the "Rules for the Technical Exploitation of the Electric Installations Annexed to Industrial Enterprises" prescribes, for some determinate cases, an individual discharge of every condenser. How, in practice, can the discharge of the upper series of condensers placed 2.5 or 3 m above the field level be carried out? The question is answered by the author of the article.

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POLYAKOV, Boris Aleksandrovich; GORTINSKIY, S.M., red.; BORUNOV, N.I., tekhn. red.

[Condenser systems for power factor improvement]Kondensatornye ustanovki dlia povysheniia koeffitsienta moshchnosti. Izd.2., perer. Moskva, Gosenergoizdat, 1962. 231 p. (MIRA 16:2)
(Electric power distribution)
(Condensers (Electricity))

POLYAKOV, Boris Alekseyevich; SERKO, G.S., red.; TIKHONOVA, Ye.A., tekhn. red.

[Work of the mate in charge of cargo on a sea-going vessel] Rabota gruzovogo pomoshchnika kapitana na morskom sudne. Moskva, Izd-vo "Morskoi transport," 1961. 86 p. (MIRA 14:11)
(Ships--Cargo)

MARETSKIY, Sergey Konstantinovich; POLYAKOV, B.F., red.; BELOUSOVA, L.I., tekhn.red.

[Tiraspol'; historical-geographic study] Tiraspol'; istoriko-geograficheskii ocherk. Kishinev, Gos.uchebno-pedagog.izd-vo Moldavskoi SSR, "Shkoala Sovetike," 1958. 102 p. (MIRA 13:2)
(Tiraspol'--Economic conditions) (Tiraspol'--History)

SOV/96-59-10-19/22

AUTHOR: Polyakov, B.I. (Engineer)

TITLE: An All-Union Conference on the Construction of Thermal Electric Power Stations

PERIODICAL: Teploenergetika, 1959, Nr 10, pp 91-92 (USSR)

ABSTRACT: A conference on the construction of thermal electric power stations was called in Moscow and was attended by representatives of design organisations, construction organisations and staff of the Ministry of Power Station Construction. The head of Glavenergoproyekt of the Ministry of Power Stations Construction F.V. Sapozhnikov gave a report on 'The principal measures required to industrialise and to cut down the cost and construction time of thermal power stations in 1959-1965'. Construction times can be reduced, and the present excessive preparatory periods of 20-33 months are required because each construction is organised individually. The cost per installed kilowatt is too high and labour productivity is not increasing fast enough. A number of other criticisms are made about the organisation of power station construction. More use should be made of pre-assembly methods in erecting power station equipment.

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An All-Union Conference on the Construction of Thermal Electric Power Stations

In this respect considerable economies can be obtained in boiler erection. Large reinforced concrete parts can be made in advance of erection. Greater use should be made of concrete with stressed reinforcement. Considerable economies in power station construction will result from the use of sets of 300 and 600 MW in stations burning natural gas as the main fuel, and from the use of power stations with gas turbines installed near the fuel centres. The cost of buildings is high and they could be considerably simplified. Many new improved types of equipment are required. Improved erection machinery such as cranes, pipe welders and the like are required. It is necessary to cut down the number of drawings and other documents required. Considerable economies can be effected by the factory manufacture of complete thermal power stations. In this case the power station should be considered as a large machine to be erected by the manufacturer. This approach could greatly alter the principles of erection. There is the possibility of manufacturing small- and medium-power stations with sets of up to 12 MW, which could be constructed in ten months.

An All-Union Conference on the Construction of Thermal Electric Power Stations

In this connection Promenergoproyekt is developing designs for medium-power stations constructed entirely of reinforced concrete units, which should greatly reduce the costs. In the discussion the opinion was expressed that it is undesirable to set up special factories to manufacture reinforced concrete assemblies; instead they should be made at existing works of Councils of National Economy and of the Ministry of Power Station Construction. A number of other rather general recommendations are made.
There are no tables, figures or literature references.

POLYAKOV, B.I., inzh.

[redacted] thermal electric power plants" by K. Shreder. Reviewed by B.I. Poliakov. Teploenergetika 8 no.8:95-96 Ag '61. (MIRA 14:10)

(Electric power plants)
(Shreder, K.)

SOV/96-59-5-17/19

AUTHOR: Polyakov, B.I., Engineer

TITLE: Scientific Research Work Carried Out at the All-Union Thermo-Technical Institute in 1958 (Nauchno-issledovatel'skiye raboty, vypolnennyye VTI v 1958 g)

PERIODICAL: Teploenergetika, 1959, Nr 5, pp 90-94 (USSR)

ABSTRACT: This is a list of report titles, authors and brief summaries. The reports fall into categories as follows: fuel, 2; furnaces, 19; boilers, 8; turbines, 12; metals, 7; water, 15; thermal automatics, 7.

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MIKHEYEV, Valentin Aleksandrovich; YAM, Vladimir Mozusovich; POLYAKOV, Boris Ivanovich; GOLOSKOV, E.I., inzh., retsenzent; OBOLDUYEV, G.T., inzh., red.; BORODULINA, I.A., red. izd-va; KUREPINA, G.N., red. izd-va; PETERSON, M.M., tekhn. red.; BARDINA, A.A., tekhn. red.

[Modernization of hydraulic press equipment] Modernizatsiia gidropressovogo oborudovaniia. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1961. 248 p. (MIRA 14:8)
(Hydraulic presses—Technological innovations)

POLYAKOV, B.I.

Geological position of Upper Jurassic intrusions in southeastern Transbaikalia and general characteristics of their structure. Vest.LGU 17 no.6:57-67 '62. (MIRA 15:4)
(Transbaikalia--Rocks, Igneous)

POLYAKOV, B.I.

Upper Jurassic intrusive and ore formations in the southeastern part of eastern Transbaikalia. Vest.LGU 15 no.12:23-35 '60. (MIRA 13:6)

(Transbaikalia--Rocks, Igneous)
(Transbaikalia--Ore deposits)

POLYAKOV, B.I.; GOREV, A.V.

Possibility of using the photoneutron method to determine the clarke of beryllium in geology. Sbor. st. VIGiON no.1: 116-129 '62. (MIRA 16:3)
(Beryllium) (Radioactive prospecting)

ACCESSION NR: AT4037698 S/2865/64/003/000/0278/0288

AUTHOR: Lebedinskiy, A.V.; Grigor'yev, Yu. G.; Lyubimova-Gerasimov, R. M.; Polyakov, B. I.

TITLE: Vegetative reactions during stimulation of the vestibular analyzer and their possible role in complicating space flight conditions

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy* kosmicheskoy biologii, v. 3, 1964, 278-288

TOPIC TAGS: acceleration, vestibular analyzer, space flight, Coriolis acceleration, rabbit, vegetative reflex

ABSTRACT: The role of angular accelerations and Coriolis accelerations on the vestibular function was studied by means of a BY-2 type accelerator, on which it was possible to produce angular accelerations ranging from 0.05 up to 1200°/sec^2 and any magnitude of angular velocity up to 180°/sec. Vegetative reactions are of special interest since by stimulating the vestibular apparatus, it is possible to observe practically all known vegetative reactions. It has been established that the magnitude of the reaction depends on the duration of the stimulus (acceleration). Data obtained indicate that after whole-body irradiation of the animal,

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ACCESSION NR: AT4037698

more time is required for acceleration to produce an equal reaction. There is reason to believe, in this case, that radiation affects the central nervous system and not the receptor. So far there have been practically no attempts made to evaluate the biological significance of vegetative reflexes which arise during stimulation of the vestibular analyzer. When rabbits were subjected to rocking in the horizontal (duration of acceleration, 0.15 sec), at 66° sec^2, a diminution of respiration amplitude was noted; at 400°/sec^2 the diminished amplitude increased in frequency; at 600°/sec^2 the amplitude dropped off sharply with no marked frequency increase; and at 1200°/sec^2 there was a distinct break in respiration. Reactions of the cardiovascular system to acceleration are complex. Thus, when rabbits are subjected to an acceleration of 0.05°/sec^2 for 30 sec, skin temperature rises. But, if accelerations are increased to 1.5 or to 3.2°/sec^2 for the same duration of time, skin temperature drops. The depressive reaction appears, apparently, only in response to large accelerations because when rabbits were accelerated in the range from 60 to 800°/sec^2 (duration, 0.15 sec), no depressive reaction was observed. When rabbits were exposed to short-term acceleration of 5°/sec^2, a diminution of blood circulation in the brain was observed. This effect was distinct if the acceleration lasted 12 or 24 seconds, but indistinct if the duration was only 6 seconds. The authors have stressed the importance of.

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POLNAROV, P.I., MINTS, A.L., NEVYAZHSKIY, I.F. (U.S.S.R.)

R. F. system for the 680 MeV machine

CERN-Symposium on High Energy Accelerators and Pion Physics

Geneva 11-23 June 56
In Branch #5

YEFREMOV, D.V.; MESHCHERYAKOV, M.G.; MINTS, A.L.; DZHELEPOV, V.P.; IVANOV, P.P.; KATYSHEV, V.S. [deceased]; KOMAR, Ye.G.; MALYSHEV, I.F.; MOSKOSZOW, N.A.; NEVYAZHSKIY, I.Kh.; POLYAKOV, B.I.; CHESTNOY, A.V.

Six-meter synchrocyclotron built by the Institute of Nuclear Problems, Academy of Sciences of the U.S.S.R. Atom.energ. no.4: 5-12 '56. (MLRA 9:12)

(Cyclotron)

POLYAKOV, B. I.

"Some Peculiarities and Fundamental Data of the High-Frequency System of a 6-meter Phasotron," A. L. Mints, I. Kh. Nevyazhskiy, and B. I. Polyakov, Radiotekhnika i Elektronika, No 7, Jul 56, pp 893-902

The technical peculiarities, construction, and fundamental parameters of the high-frequency system (26.5 to 13.6 megacycles), of a 6-meter phasotron of the Institute of Nuclear Proolems of the Academy of Sciences USSR are presented.

Participants and their contributions to the project were V. M. Lupulov and I. F. Malyshev, dealing with the mechanical problems; engineers G. P. Grudinskaya, G. I. Zhileyko, B. T. Zarubin, V. G. Kul'man, and A. L. Savenkov, dealing with the radio engineering problems; and I. G. Klyatskin, N. K. Titov, and V. F. Trubetskoy, dealing with the construction of the high-frequency system of a 5-meter phasotron.

SUM. 1805

POLYAKOV, B. I., YEFREMOV, D. V., MESHCHERYAKOV, M. G., MINTS, A. L., DZHELEPOV, V. P., IVANOV, P. P., KATISHEV, V. S., KOMAR, E. G., MONOZSON, N. A., NEVIAZHSKIY, I. Kh., CHESTNOY, A. Y.

"The USSR Academy of Sciences' 6 Metre Synchrocyclotron," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

FOLYAKOV, B. I., MINTS, A. L., NEVAZHSKIY, I. Kh.

"Radio-Frequency System for the 680 MeV Proton Synchrocyclotron," paper presented at CERN Symposium, 1956, appearing in Nuclear Instruments, No. 1, pp. 21-30, 1957

ZAKUBIN, B.T.; POLYAKOV, B.I.

Pulse conditions of an oscillator equipped with powerful ultrashortwave tubes having thorium and carbide coated cathodes. Nauch.dokl.vys.shkoly; radiotekh. i elektron. no.2:175-179 '58. (MIRA 12:1)

1. Radiotekhnicheskiy institut AN SSSR.
(Oscillators, Electron-tube)

BORZUNOV, N.A.; KUZ'MINA, N.Ya.; NEVYAZHSKIY, I.Kh.; OSOVETS, S.M.; PETROV, Yu.F.; POLYAKOV, B.I.; POPOV, I.A.; KHODATAYEV, K.V.; SHIMCHUK, V.P.

Studying a plasma on a traveling wave setup. Dokl. AN SSSR 152 no.3:581-584 S '63. (MIRA 16:12)

1. Predstavleno akademikom A.L.Mintsem.

L 46960-66 EWT(1) SCTB DD

ACC NR: AP6031343 SOURCE CODE: UR/0219/66/062/009/0019/0022

AUTHOR: Polyakov, B. I. (Moscow)

ORG: none

TITLE: Quantitative study of vestibular-autonomic reflexes under experimental conditions

SOURCE: Byulleten' eksperimental'noy biologii i meditsiny, v. 62, no. 9, 1966, 19-22

TOPIC TAGS: animal physiology, vestibular analyzer, vestibular function, biologic acceleration effect, rabbit

ABSTRACT: Experiments were conducted to establish threshold values of adequate vestibular (semicircular canal) stimuli causing autonomic reactions in rabbits, and to study the relationship between amount of acceleration and degree of response. Angular accelerations were created on VU_2 and VU_3 apparatus [VU = rotating assembly]. Rabbits were rotated with a subthreshold angular acceleration of 5 deg/sec^2 up to a constant angular velocity of 5—180 deg/sec. A stop stimulus was given after two min of uniform rotation. Deceleration time, corresponding to a negative angular acceleration of 33—1200 deg/sec^2, was 0.15 sec. Pulse rate, respiratory movements, and systolic pressure were measured at ten-sec intervals before rotation, during uniform rotation, and 30—90 sec after the stop stimulus. Blood pressure was recorded in a carotid loop or in the brachial artery. The interval between stimuli

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decreasing arterial pressure after rotation increased. The vestibular-vascular reaction was more evident with this method of recording. Experimental results showed that arterial pressure dropped 9.6—17.2% ten sec after rotation, beginning with an acceleration threshold of 600 deg/sec^2. As the stimulus increased, the degree of the reaction also increased. When tests were repeated, higher thresholds were obtained [illegible] deg/sec^2 for a change in breathing rate, and 800 deg/sec^2 for a change in blood pressure. This indicates the possibility of considerable variations in vestibular-autonomic thresholds in healthy animals. Reliable shifts in the autonomic indices investigated were not observed in labyrinthectomized animals. Orig. art. has: 1 figure. [SC]

SUB CODE: 06/ SUBM DATE: 30Jun65/ ORIG REF: 008/ OTH REF: 004 / ATD PRESS: 5088

Card 2/2 mt

ACC NR: AT6036620 SOURCE CODE: UR/0000/66/000/000/0312/0313

AUTHOR: Polyakov, B. I.

ORG: none

TITLE: Vestibular sympathetic adaptation under conditions of prolonged periodic exposure of the organism to Coriolis accelerations [Paper presented at the Conference on Problems of Space Medicine held in Moscow from 24-27 May 1966]

SOURCE: Konferentsiya po problemam kosmicheskoy meditsiny, 1966. Problemy kosmicheskoy meditsiny. (Problems of space medicine); materialy konferentsii, Moscow, 1966, 312-313

TOPIC TAGS: biologic acceleration effect, coriolis acceleration, vestibular function, vestibular analyzer, animal physiology, nystagmus

ABSTRACT:

The aim of this study was to determine the capacity, adaptation duration, character, and adaptation stability of the vestibular analyzers of rabbits exposed to 15 days of continuous rotation on a special test stand at a rate of 21° /sec. Prior to exposure, 1, 3, 7, 10, and 15 days after the beginning of the test, and 1, 3, and 7 days after the termination of the test, the vestibular autonomic reactions of 30 animals were studied vestibulometrically.

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Card 2/2

POLYAKOV, B.I.; KLEVTSOV, P.P.; YEGOROV, E.V.

A laboratory equipment for the quantitative determination of the Clark beryllium concentrations. Vop. rud. geofiz. no.5: 142-145 '65. (MIRA 18:9)

L 16145-65 EWT(m)/EPA(w)-2/EWA( )-2 Pt-7/Pab-10 IJP(c) GS

ACCESSION NR: AT5007934 S/0000/64/000/000/0462/0467

AUTHOR: Kapchinskiy, I. M.; Kul'man, V. G.; Lazarev, N. V.; Murin, B. P.; Nevyazhskiy, I. Kh.; Plotnikov, V. K.; Polyakov, B. I.

TITLE: Design of an injector for the 70-Gev proton synchrotron

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963, Trudy. Moscow, Atomizdat, 1964, 462-467

TOPIC TAGS: high energy accelerator, proton synchrotron, proton accelerator

ABSTRACT: The injector of the 70-Gev proton synchrotron is a strong-focusing linear accelerator, which consists of three cylindrical resonators with drift tubes. The proton beam is generated by a duaplasmatron and is preliminarily accelerated in an electrostatic shock tube up to 700-kev. The high-voltage source for the tube is a pulse transformer. The fore-injector was developed by the NIIEFA GKAE SSSR. The proton energy at the injector's output is assumed to be 100 Mev, which, on the one hand, ensures the capture of the particles into the synchrotron state at an initial field strength in the ring chamber of 75 gauss, and, on the other hand, permits the maintenance, along the entire length of the injector, of a monotypic accelerating

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ACCESSION NR: AT5007934

system without substantial lowering of the shunt-impedance at the ring's output. The phase volume of the beam is connected with the emmittance of the beam by the relation $\nu = \frac{\beta}{\sqrt{1-\beta^2}}$ and is an invariant quantity. A similar relation exists between the capacity and the acceptance of the channel. The specific acceleration is the ratio of the increment of energy of a synchronous particle per wave length to the rest energy. The synchronous phase is read off from the maximum of the field. The shunt-impedance is measured as the quotient of twice the high-frequency power loss in the copper divided by the square of the amplitude of the accelerating field. Values of the shunt-impedances and of the Q factor are taken with a three-halves allowance relative to the computed quantities. The frequency of the accelerating field was chosen lower than that in the injectors of the proton synchrotrons of CERN and Brookhaven. The choice of a 150 mc frequency was dictated mainly by the desire to obtain sufficiently high capacity for the channel. The length and, correspondingly, the cost of the injector were therefore increased somewhat, which, however, is compensated by a lowering of the high-frequency power loss in the resonators. The capacity of the focusing channel equals 0.4 cm·millirad, which ensures the possibility of raising the output current of the injector up to 100 milliamperes for a beam phase volume of 0.1 cm·millirad (I. M. Kapchinskiy, *Atomnaya*

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energiya, 13, 235 (1962)). For the chosen values of the specific acceleration and of the synchronous phase, the longitudinal Coulomb repulsion does not limit the beam current until the extreme space charge values are reached, which are determined by the transverse lateral repulsion (I. M. Kapchinskiy, A. S. Kronrod, present conference, p. 906). It is assumed that the acceleration will be mainly due to the energy preliminarily stored in the resonators. The field drop during the 12 μsec proton pulse amounts to approximately 15% and will be corrected by the generator's focusing during the proton current pulse, for which standby power is provided. In addition, it is proposed that the initial value of the synchronous phase should be increased. The capacity of the synchrotron's ring chamber equals 1 cm·millirad, which permits realization of a three-revolution injection of about 40 μsec duration for a correspondingly lower beam current. Such an injection scheme is provided as an alternative to other schemes. The present report discusses in detail the radio engineering aspects of the system, the focusing system, and the design. "The design of the injector was carried out under the scientific guidance of V. V. Vladimirskiy and A. L. Mints. The design was developed by the joint participation of the following associates of the Institute of Theoretical and Experimental Physics, GKAE SSSR, the Radio Engineering Institute AN SSSR, the Scientific-Research Institute of Electro-physical Equipment imeni D. V. Yefremov GKAE SSSR and other organizations: M. I. Basalayev, V. A. Batalin, Yu. P. Vakhrushin, Ye. N. Danil'tsev,

L 46155-65

ACCESSION NR: AT5007934

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A. A. Zhdanko, F. G. Zheleznikov, N. M. Kristi, N. I. Kisin, N. V. Kovalev, K. M. Kozlov, N. S. Podoynitsyn, A. V. Popkovich, I. M. Royfe, V. F. Semenov, A. V. Solnyshkev, N. K. Titov, and others." Orig. art. has: 2 figures, 2 tables.

ASSOCIATION: Radiotekhnicheskiy institut AN SSSR (Radio Engineering Institute, AN SSSR)

SUBMITTED: 26May64 ENCL: 00 SUB CODE: NP

NO REF SOV: 005 OTHER: 000

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YEGOROV, E.V.; POLYAKOV, B.I.

Taking into account the self-absorption of photoneutrons during the quantitative determination of the content of beryllium in ores. Vop. rud.geofiz. no.47:74-77 '64. (MIRA 18:1)

ARLASHCHENKO, N.I.; BOKHOV, B.B.; BUSYGIN, V.Ye.; VOLOKHOVA, N.A.; GRIGOR'YEV, Yu.C.; POLYAKOV, B.I.; FARBER, Yu.V.

Body reactions during the prolonged effect of coriolis accelerations. Biul. eksp. biol. i med. 56 no.8:28-33 Ag '63. (MIRA 17:7)

1. Naushnyy rukovoditel' - deystvitel'nyy chlen AMN SSSR prof. A.V. Lebedinskiy. Predstavleno deystvitel'nym chlenom AMN SSSR A.V. Lebedinskim.